National Institute of Environmental Health Sciences

Seasonality of viral infections: Mechanisms and unknowns

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Year: 2012
Journal: Clinical Microbiology and Infection : The Official Publication of The European Society of Clinical Microbiology and Infectious Diseases. 18 (10): 946-954

Abstract:

Seasonality is a long-recognized attribute of many viral infections of humans, but the mechanisms underlying seasonality, particularly for person-to-person communicable diseases, remain poorly understood. Better understanding of drivers of seasonality could provide insights into the relationship between the physical environment and infection risk, which is particularly important in the context of global ecological change in general, and climate change in particular. In broad terms, seasonality represents oscillation in pathogens' effective reproductive number, which, in turn, must reflect oscillatory changes in infectiousness, contact patterns, pathogen survival, or host susceptibility. Epidemiological challenges to correct identification of seasonal drivers of risk include failure to adjust for predictable correlation between disease incidence and seasonal exposures, and unmeasured confounding. The existing evidence suggests that the seasonality of some enteric and respiratory viral pathogens may be driven by enhanced wintertime survival of pathogens, and also by increased host susceptibility resulting from relative 'wintertime immune suppression'. For vector-borne diseases and zoonoses, environmental influences on vector or reservoir abundance, and vector biting rates, are probably more important. However, numerous areas of uncertainty exist, making this an exciting area for future research.

Source: http://dx.doi.org/10.1111/j.1469-0691.2012.03968.x

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease, Respiratory Effect

Infectious Disease: Airborne Disease, Foodborne/Waterborne Disease, Vectorborne Disease, Zoonotic Disease

Airborne Disease: Influenza, Respiratory Synctial Virus (RSV)

Foodborne/Waterborne Disease (other): gastroenteritis

Vectorborne Disease: General Vectorborne

Zoonotic Disease: General Zoonotic Disease

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified